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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/000,341	12/04/2001	Amit Dagan	2207/12613	9752
23838	7590	08/17/2004	EXAMINER	
KENYON & KENYON 1500 K STREET, N.W., SUITE 700 WASHINGTON, DC 20005			KERVEROS, JAMES C	
			ART UNIT	PAPER NUMBER
			2133	

DATE MAILED: 08/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/000,341

Applicant(s)

DAGAN ET AL.

Examiner

James C Kerveros

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-9, 11-16, 18, 20, 21 and 23 is/are rejected.
- 7) ☒ Claim(s) 4, 10, 17, 19 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

1. Claims 1-23 are pending and are hereby presented for examination.

Drawings

2. The drawings are objected to because FIGS. 5, 7-10, 12, 13, 15, 16 and 18 contain shaded areas, which cause the descriptive legends non legible.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 5 and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Hladik et al. (US 6594792).

Regarding Claim 1, Hladik discloses a turbo decoding system 80 employing multiple turbo decoder modules 82 including an interleaver/de-interleaver module 84 which receives data turbo code words from an analog-to-digital (A/D) converter (FIGS. 3, 4), comprising:

Partitioning an input bit-stream of the data turbo code words from the analog-to-digital (A/D) into at least two bit-streams using Interleaver/de-interleaver module 84 for interleaving the at least two bit-streams to produce a first bit-stream, by dividing the received turbo code words into multiple segments, each respective segment being provided to a respective decoder

chip 82, where the first bit-stream corresponds to first half iteration of the turbo decoder MAP decoding algorithm.

Partitioning the first bit-stream which is the first half iteration of the turbo decoder into at least two different bit-streams, and using Interleaver/de-interleaver module 84 upon completion of the first half iteration of decoding, wherein a posteriori bit probability signals (APP's) are provided to the interleaver/de-interleaver module where they are re-ordered according to the interleaver.

Regarding Claims 2 and 5, Hladik discloses (FIG. 4) a number of bit-streams (N decoders), which is also shown in (FIG. 3) employing multiple (e.g., four) turbo decoder modules for decoding a code word. The claimed invention recites "at least two bit-streams is between 2^n and 2^{n+1} , where n is an integer, interleaving 2^n of the at least two bit-streams to produce the first bit-stream". If $n=1$, then the number of the bit-streams is between 2 and 4, which meets the required (N decoders) disclosed by Hladik, where $N=0, 1, 2 \dots N+1$.

Regarding Claims 3 and 6, Hladik discloses (FIG. 4) a number of bit-streams (N decoders), which is also shown in (FIG. 3) employing multiple (e.g., four) turbo decoder modules for decoding a code word. The claimed invention recites "at least two bit-streams is between 2^n and 2^{n+1} , where n is an integer, interleaving 2^n of the at least two bit-stream to produce the first bit-stream". If $n=1$, then the number of the bit-streams is between 2 and 4, which meets the required (N decoders) disclosed by Hladik, where $N=0, 1, 2 \dots N+1$. Interleaving

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the 2^{n+1} bit-streams ($N=4$) to produce the first bit-stream, corresponding bits of each of the ($N=4$) bit-streams being alternately placed in the first bit-stream.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7-9, 11-16, 18, 20, 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hladik et al. (US 6594792).

Regarding independent Claims 7, 14, 21, Hladik substantially discloses the pertinent limitations as recited in claim 1 above. In addition, recited in claim 14, Hladik discloses a turbo decoder (10, FIG. 1) including a memory device (16 and 20) for storing top and bottom code parity data, and a processor address generator 19 for implementing a MAP decoding algorithm, in communication with the memory device, configured to partition an input bit-stream such as data turbo code words from an analog-to-digital (A/D) into at least two bit-streams,

Regarding independent Claims 7, 14, 21 and dependent Claims 13, 20, 23 Hladik does not explicitly disclose the limitation of "when the data exceed a predetermined bit rate, iteratively, shuffling consecutive bits in adjacent different bit-streams into a more or less significant bit position, wherein shuffling the consecutive bits comprises dividing the one of the different bit-streams into

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groups, each group including a predetermined number of consecutive bits; and rotating the bits within each of the groups a predefined number of positions left or right".

However, Hladik discloses turbo decoder module, which has a predetermined maximum code-word size corresponding to N information bits, and a predetermined maximum decoding rate. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the predetermined maximum decoding bit rate in the device of Hladik, for performing an error correction, since a known characteristic of turbo codes is that their error correction capability increases with code word length.

Regarding Claims 8, 11, 15, Hladik discloses (FIG. 4) a number of bit-streams (N decoders), which is also shown in (FIG. 3) employing multiple (e.g., four) turbo decoder modules for decoding a code word. The claimed invention recites "at least two bit-streams is between 2^n and 2^{n+1} , where n is an integer, interleaving 2^n of the at least two bit-streams to produce the first bit-stream". If $n=1$, then the number of the bit-streams is between 2 and 4, which meets the required (N decoders) disclosed by Hladik, where $N=0, 1, 2 \dots N+1$.

Regarding Claims 9, 12, 16, 18, Hladik discloses (FIG. 4) a number of bit-streams (N decoders), which is also shown in (FIG. 3) employing multiple (e.g., four) turbo decoder modules for decoding a code word. The claimed invention recites "at least two bit-streams is between 2^n and 2^{n+1} , where n is an integer, interleaving 2^n of the at least two bit-stream to produce the first bit-stream". If $n=1$, then the number of the bit-streams is between 2 and 4, which meets the

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required (N decoders) disclosed by Hladik, where $N=0, 1, 2 \dots N+1$. Interleaving the 2^{n+1} bit-streams ($N=4$) to produce the first bit-stream, corresponding bits of each of the ($N=4$) bit-streams being alternately placed in the first bit-stream.

Allowable Subject Matter

5. Claims 4, 10, 17, 19, 22, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior arts of record taken alone or in combination fail to teach, anticipate, suggest or render obvious the claimed invention of mathematical expressions relayed to bit-stream interleaving, recited in claims 4, 10, 17 and 22. Claim 19 depends from claim 17 and therefore is also objected.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James C Kerveros whose telephone number is (703) 305-1081. The examiner can normally be reached on 9:00 AM TO 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

U.S. PATENT OFFICE
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Date: 28 July 2004
Office Action: Non-Final Rejection

By: 

James C Kerveros
Examiner
Art Unit 2133

Guy J. Lamarre
Primary Examiner